

Abstract Submitted
for the Mar98 Meeting of
The American Physical Society

Sorting Category: 9d.21c

**High Resolution Heat Capacity Measurement near
the Liquid-Gas Critical Point of ^3He** * INSEOB HAHN, FANG

ZHONG, MARTIN BARMAITZ, *Jet Propulsion Lab., Caltech* - The divergence of the compressibility near the liquid-gas critical point of a fluid induces significant density gradients that limit the accuracy of critical exponents measured in earth-bound laboratories. A flight experiment to perform thermodynamic measurements of ^3He near the critical point is in preparation. In a microgravity environment heat capacity data can be attained within an additional two decades in reduced temperature ($\epsilon = T/T_c - 1$) closer to the phase transition than on earth [H. R. Moosmüller *et al.*, Rev. Mod. Phys. Vol. 51, 79 (1979)]. We are currently developing an experimental cell to accurately measure the heat capacity and isothermal compressibility of ^3He near its critical point ($T_c = 3.31$ K). Our sample cell is 0.5 mm high to minimize gravity effects. High resolution sensors were developed for measuring temperature, density and pressure at low temperature. A new nano-Kelvin high resolution thermometer (HRT) based on the paramagnetic GdCl_3 salt was developed for measurements near the ^3He critical point. A description of the low temperature calorimeter and recent specific heat measurements near the critical point will be presented.

*Supported by NASA.

- ☐ Prefer Oral Session
☐ Prefer Poster Session

Inseob Hahn
hahn@squid.jpl.nasa.gov
Jet Propulsion Lab., Caltech

Date submitted: December 1, 1997

Electronic form version 1.1